



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,441	04/08/2004	Max Herla	HERLA	7169
20151 7590 02/22/2007 HENRY M FEIEREISEN, LLC 350 FIFTH AVENUE SUITE 4714 NEW YORK, NY 10118			EXAMINER GATES, ERIC ANDREW	
			ART UNIT	PAPER NUMBER
			3722	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/22/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

C D

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,441	<b>Applicant(s)</b> HERLA, MAX	
	<b>Examiner</b> Eric A. Gates	<b>Art Unit</b> 3722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-8,10-12 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10-12 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 January 2007 has been entered.

### ***Drawings***

2. A replacement drawing for Figure 3 was received on 23 January 2007. This drawing is acceptable.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, how the spindle head assembly and the drive unit are detachably connected to one another to allow an exchange of the tool, while the spindle unit rotates, as claimed in claim 1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

Art Unit: 3722

number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

4. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification does not disclose how the spindle head assembly and the drive unit are detachably connected to one another to allow an exchange of the tool, while the spindle unit rotates. Appropriate correction is required; no new matter should be entered.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

Art Unit: 3722

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 3-8, 10-12, and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Therefore, as there was no explanation in the original description as to how the spindle head assembly and the drive unit being detachably connected to one another would allow for an exchange of the tool while the spindle unit rotates, this subject matter must be deleted from claim 1.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 4, 7, 8, 10, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller (German Patent DE 101 23 717.0) in view of Brohammer (U.S. Patent 4,944,638) and Tomita et al. (U.S. Patent 4,409,721).

9. Regarding claim 1, Muller discloses a spindle unit 1 for a machine tool, comprising: a drive unit 3 having a drive shaft (rotor of drive unit 3 as seen in figure 1); a spindle head assembly 2 having a hollow spindle head shaft 4 driven by the drive unit; a tie rod 13 arranged for axial displacement in the hollow spindle head shaft 4 between

Art Unit: 3722

rearward and forward positions and detachably coupled with the drive shaft (through shaft 4, the tie rod and drive shaft may be detached when the assembly is disassembled); a collet (not labeled but seen in figure 1) placed in a pocket of the spindle head shaft 4 and interacting with the tie rod 13 to clamp a tool 14 and to expel the tool; a bearing assembly 10 supporting the drive shaft (through shaft 4); and a shifting unit 26 for moving the bearing assembly 10 in an axial direction (through bearing bush 11) to thereby displace the drive shaft together with the tie rod 13 between the rearward and forward positions (see page 11, paragraph starting "Durch den", through page 12).

Muller does not distinctly disclose that the collet clamps the tool when the tie rod assumes the rearward position, and expels the tool when the tie rod assumes the forward position. However, the Examiner takes Official Notice that it is well known in the art for a collet to clamp a tool when the tie rod assumes a rearward position, and expel the tool when the tie rod assumes a forward position. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have designed the spindle unit of Muller to clamp and release the tool as described above.

Muller does not disclose wherein the spindle head assembly and the drive unit are positioned in axially successive relationship and detachably connected to one another to allow an exchange of the tool, while the spindle unit rotates.

Brohammer teaches the use of a drill head 10 that has a drive unit 20 that is in axially successive relationship and detachably connected to a spindle 50 for the

Art Unit: 3722

purpose of allowing easy removal and replacement of the spindle and to allow an exchange of a tool 100. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the spindle unit of Muller with the spindle unit of Brohammer in order to have a spindle unit that allows for easier replacement of the spindle if the spindle fails.

Tomita et al. teaches the use of a machine tool with an automatic tool change function that allows for replacement of a tool T while spindle 11 rotates for the purpose of replacing the tool without having to stop the machine. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the modified spindle unit of Muller with the tool change capability of Tomita et al. in order to have a spindle unit that allows for tool change without turning off the drive unit.

10. Regarding claim 4, the modified invention of Muller discloses wherein the drive shaft has a central bore (bore in which shaft 4 is located) for transporting a material, said tie rod 13 having a tube 13 extending into the central bore and being removable therefrom.

11. Regarding claim 7, the modified invention of Muller discloses wherein the drive unit 3 includes an electric motor having a rotor (see figure 1, drive 3 includes a rotor and a stator) mounted on the drive shaft for conjoint displacement with the drive shaft (see page 10, paragraph starting "Die Zeichnungsfigur").

12. Regarding claim 8, the modified invention of Muller discloses wherein the electric motor includes a stator (see figure 1, drive 3 includes a rotor and a stator) which

Art Unit: 3722

completely surrounds the rotor independent of a displacement position of the shifting unit.

13. Regarding claim 10, the modified invention of Muller discloses wherein the drive shaft has opposite ends, said bearing assembly having a bearing sleeve 6 for support of one end (right end in figure 1) of the drive shaft (supports the drive shaft through the shaft 4), and another bearing sleeve 5 for support of the other end (left end in figure 1) of the drive shaft (supports the drive shaft through the shaft 4).

14. Regarding claim 11, the modified invention of Muller discloses the invention substantially as claimed, except Muller does not disclose wherein the shifting unit is constructed for operation by one of hydraulic means, pneumatic means, and electromechanical means. However, the Examiner takes Official Notice that it is well known in the art for a shifting unit of this type to be constructed for operation by hydraulic means, pneumatic means, or electromechanical means for the purpose of using a well known actuation method for shifting.

15. Regarding claim 15, the invention of Muller as modified by Brohammer discloses the invention substantially as claimed, except the modified invention of Muller does not disclose wherein the spindle head assembly is disposed in coaxial relationship to the drive unit. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to align the center spindle head assembly with the drive unit as disclosed in Brohammer for the purpose of having a direct path from the drive unit to the center spindle, since it has been held that rearranging parts of an invention involves only routine skill in the art.



16. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller, Brohammer and Tomita et al., in view of Kameyama et al. (U.S. Patent 5,009,554).

17. Regarding claim 3, the modified invention of Muller discloses the invention substantially as claimed, except Muller does not disclose the spindle head shaft to be constructed as a spline shaft, or the drive shaft having an end face constructed as a hollow wheel to complement the spline end of the spindle head shaft to enable coupling. Kameyama et al. teaches a spindle head shaft 6 that has one end facing the drive shaft 13b and constructed as a spline shaft 15, and said drive shaft 13b having an end face constructed as a hollow wheel 16 to complement the one end 15 of the spindle head shaft 6 to for the purpose of enabling coupling between the two parts. Therefore it would have been obvious to one having ordinary skill in the art to have combined the modified spindle unit of Muller with the spindle head shaft and drive shafts of Kameyama et al. in order to have an alternative means of attachment between the two.

18. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller, Brohammer and Tomita et al., in view of Sugata (U.S. Patent 5,676,506).

19. Regarding claim 5, the modified invention of Muller discloses the invention substantially as claimed, except Muller does not disclose wherein the tie rod has a central bore for transporting lubricant, said drive shaft having a tube extending into the central bore and being removable therefrom.

Sugata discloses a tie rod 44 having a central bore for the purpose of transporting lubricant, and a drive shaft 46 having a tube 12 extending into the central bore of the tie rod and being removable therefrom for the purpose of transporting the lubricant through the tie rod. Therefore it would have been obvious to one having ordinary skill in the art to have combined the modified spindle unit of Muller with the tie rod and drive shaft of Sugata in order to have an alternative means of supplying lubricant to the tool.

20. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller, Brohammer and Tomita et al., in view of Chen (U.S. Patent 6,464,435).

21. Regarding claim 6, the modified invention of Muller discloses the invention substantially as claimed, except Muller does not disclose the drive shaft and tie rod to be formed as one piece. Chen teaches a drive shaft 42 and tie rod 42 which are formed from one piece for the purpose of simplification of the spindle unit assembly. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Muller with the drive shaft and tie rod combination of Chen in order to have a simpler assembly.

22. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller, Brohammer and Tomita et al.

23. Regarding claim 12, the modified invention of Muller discloses wherein during operation of the spindle unit, the shifting unit 26 is controlled so as to cause the drive

Art Unit: 3722

shaft to axially contact the tie rod 13 (through contact with shaft 4), and further comprising a sensing device constructed for measuring an axial position of the reference surface 21 and thereby implementing an indirect measurement of an axial position of the tie rod. Muller does not distinctly disclose that the sensing device is constructed for measuring an axial position of the drive shaft. However, since the drive shaft and the reference surface are interconnected through the spindle head shaft, it would have been obvious to one having ordinary skill in the art at the time the invention was made to directly measure the axial position of the drive shaft instead of the reference surface for the purpose of determining the position of the tie rod and the state of chucking (see paragraph [0025], since it would only involve placing the sensor 19 in a different position in the assembly, and it has been held that rearranging parts of an invention involves only routine skill in the art.

### ***Response to Arguments***

24. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

25. Regarding Applicant's request for a citation to document that it is well known in the art for a collet to clamp a tool when the tie rod assumes a rearward position, and expel the tool when the tie rod assumes a forward position, the Examiner directs Applicant's attention to U.S. Patent 5,823,722 to Takenaka, in which collet 25 and tie rod 24 operate in the required manner.

Art Unit: 3722

26. Regarding the rejection of claim 11, the Official Notice statement has been taken to be admitted prior art because applicant failed to traverse the examiner's assertion of Official Notice.

27. For the reasons as set forth above, the rejections are maintained.

### ***Conclusion***

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is 571-272-5498. The examiner can normally be reached on Monday-Thursday 7:45-6:15.

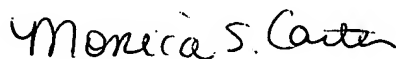
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on 571-272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3722

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EAG  
16 February 2007

  
MONICA CARTER  
SUPERVISORY PATENT EXAMINER

REPLACEMENT SHEET

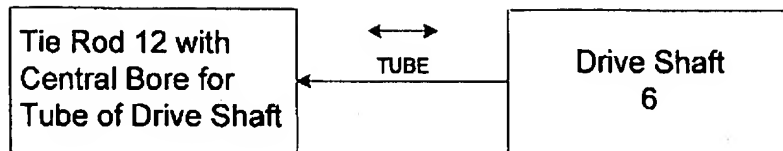


FIG. 3

Okay to enter  
LAD 2/16/07